ADITYA PAWAR

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EDUCATION

B.Tech (Honors) in Electronics and Telecommunication Engineering   **2026 (Expected)**
COEP Technological University, Pune, India   *CGPA: 8.79/10*

PUBLICATIONS

- **A. Pawar** and S. Deshmukh. *Novel Clustering Approach for Anomaly Detection in 5G Signals.* IEEE INCET, 2025. [Link]
- **A. Pawar** and S. Deshmukh. *Enhancing Predictive Digital Twin Modeling with Machine Learning.* IEEE MECOM, 2025. (To appear in IEEE Xplore)

RESEARCH EXPERIENCE

Research Intern | aeroLiFi GmbH   **May 2025–August 2025**
Advisor: Dr. Markus Werner   *Germany*

- Experimented with lens aperture, focal length variations, and multiple antenna configurations for Vehicle-to-Vehicle (V2V) LiFi communication, achieving a 20% improvement in signal-to-noise ratio.
- Deployed and tested a real-time 4G LTE system integrated with LiFi technology, achieving data rates up to 20 Mbps over optical wireless channels (Access Point–to–End Point) and 10 Mbps for User-to-User communication via the Access Point.
- Verified that the lower data rates in the integrated 4G LTE system resulted from inherent srsRAN 4G limitations rather than the LiFi OFE module.
- Demonstrated proof of concept for the LiFi OFE module's compatibility with various Software Defined Radios (SDRs), confirming its capability to replicate any communication signal up to 40 MHz bandwidth within its optical front-end capabilities.

Research Intern at Signal Processing Lab | COEP Technological University   **May 2024–Present**
Advisor: Dr. Shilpa Metkar   *Pune, India*

- Researching advanced digital forensics and steganalysis algorithms to break robust steganography techniques in the spatial domain.
- Developed a deep learning model using convolutional neural networks (CNNs) to detect and break multiple steganography algorithms, achieving 85% accuracy at 0.4 bpp on the BOSSBase dataset, targeting SUNIWARD and WOW algorithms.
- Working to improve detection performance at 0.2 bpp and enhance model robustness and generalization across benchmark datasets.

Volunteer Research Assistant | Stanford University   **March 2024–September 2024**
Advisor: Dr. Michael Ghijsen   *Stanford, CA*

- Investigated the use of deep learning for quantifying fluid overload on CT by segmenting subcutaneous fat regions at specific vertebral body levels.
- Generated and annotated custom segmentation masks for the region of interest in a dataset of medical images.
- Implemented the nnU-Net model for automated body-wall segmentation in medical imaging.

PROJECTS

- **Data Analytics:** Implemented and improved a fully automated trading system in Python using quantitative strategies based on Postmodern Portfolio Theory (PMPT). Integrated recurrent neural networks (RNNs) for time-series prediction and optimized trade decisions with risk management, performance monitoring, and reporting modules.
- **Federated Black-Box Semantic Segmentation:** Implemented the BlackFed framework for privacy-preserving semantic segmentation via federated learning. Experimented with dynamic U-Net splits to support clients with varying compute capabilities, with potential applications in medical imaging.
- **Speech Emotion Recognition:** Enhanced feature extraction and achieved improved performance over traditional SER baselines. Deployed on Raspberry Pi and explored parallel CNN architectures, analyzing the effect of feature concatenation at different stages.
- **LiFi Communication System:** Developed a LiFi-based wireless communication system transmitting audio data over 4–5 meters using visible light. Integrated an analog multiplexer for multiple audio sources and demonstrated LiFi-based internet transmission for high-speed communication.

SERVICE & PRESENTATIONS

Presenter | IEEE MECOM 2025 | Research Collaboration Pitch Session, Egypt   **November 2025**

- Presented a research proposal on 6G signal jamming and localization at the flagship Pitch Session organized by the IEEE Communications Society (ComSoc) during MECOM 2025, Egypt, after being selected from a highly competitive pool of international submissions.
- Engaged with industrial leaders from Qualcomm, Nokia, ZTE, Huawei, and Samsung, as well as academic experts, to discuss future research directions and potential collaborations in next-generation wireless communication.

Subreviewer | IEEE TENSYMP 2025   **March 2025**

- Served as a sub-reviewer for three papers at the IEEE TENSYMP 2025 symposium, covering two technical tracks: Artificial Intelligence & Digital Information, and Communications & Aerospace Systems.
- Evaluated submissions for technical rigor, novelty, relevance, and clarity of presentation, providing detailed and constructive feedback to authors.